CLAIMS

What is claimed is:

1   1. A hard copy imaging system, comprising:

2   a first communications network configured to operate in a first

3 communication link format;

4   a second communications network configured to operate in a second

5 communication link format;

6   a plurality of hard imaging devices communicatively coupled to the first

7 communications network;

8   an external device communicatively coupled to the second

9 communications network, the external device being configured to forward a

10 print request to at least one of the plurality of hard imaging devices for

11 processing; and

12   a print server communicatively coupled to the plurality of hard imaging

13 devices via the first communications network and to the external device via the

14 second communications network, the print server being configured to receive

15 the print request from the external device in the second communication link

16 format and automatically generate a translated print request in the first

17 communication link format for processing by at least one of the plurality of hard

18 imaging devices, the print server being further configured to automatically

19 generate and communicate a signal to the external device, the signal being

20 indicative of individual hard imaging devices among the plurality of hard imaging

21 devices configured to be supported by the print server even if the plurality of

22 hard imaging devices are not configured to support the second communication

23 link format.

1   2. The system of claim 1, wherein a user of the external device being

2 enabled to identify the individual hard imaging devices to service the print

3 request generated in the second communication format and sent via the print

4 server, and wherein the first and second communication link formats are

5 configured to have similar communication link formats but with differing

6 communication protocol layers.

1   3. The system of claim 1, wherein the first communications network is a
2   local area network (LAN).

1   4. The system of claim 1, wherein the second communications network
2   comprises one of a wired network or a wireless network.

1   5. The system of claim 1, wherein the print server is configured to
2   support multiple discovery techniques including Bluetooth service discovery
3   protocol, and Universal Plug and Play Service Discovery protocol.

1   6. The system of claim 1, wherein the print server is configured to
2   advertise to the external device that the print server supports a plurality of
3   communication protocols and standards even if the individual hard imaging
4   devices of the plurality of hard imaging devices are not configured to support the
5   plurality of communication protocols and the standards.

1   7. The system of claim 1, wherein the print server is configured to
2   incorporate security features to only permit a user of the external device to
3   forward a print request to individual ones of the plurality of hard imaging devices
4   having the security features.

1   8. The system of claim 1, wherein the print server is configured to
2   support a plurality of communication protocols and operating systems.

1   9. The system of claim 8, wherein the print server comprises:
2   a communications interface configured to communicate with the first and
3   second communications networks;
4   a storage device configured to store information related to the hard
5   imaging devices and instructions to process print requests received from the
6   external device; and
7   processing circuitry configured to communicate with the external device
8   and individual ones of the plurality of hard imaging devices, wherein
9   communication with the external device being performed using the second

10 communication link format and communication with the individual ones of the

11 plurality of hard imaging devices being performed using the first communication

12 link format.

1   10. The system of claim 9, wherein the processing circuitry of the print

2 server comprising:

3   a first memory device configured to store data for operation of the print

4 server;

5   a second memory device configured to store firmware data;

6   status indicator devices configured to provide an indication of status of

7 the hard imaging devices; and

8   a plurality of physical layer components configured to convert print

9 requests in the second communication link format to the first communication

10 link format.

1   11. The system of claim 10, wherein print requests from the external

2 device are received via the second communication network by one of the

3 physical layer components, processed by the processing circuitry, and

4 transmitted to the first communication network via another of the physical layer

5 components.

1   12. The system of claim 10, wherein the processing circuitry further

2 comprises:

3   a plurality of media access controllers (MAC), individual MACs being

4 configured to provide link access to a specific communication protocol;

5   a first controller configured to control operations of the first memory

6 device; and

7   a second controller configured to control operations of the second

8 memory device.

1   13. The system of claim 12, wherein the processing circuitry further

2 comprises:

3   information related to higher layer network protocols; and

4   bridge logic to enable flow of information between the first and second

5   communication networks.

1   14. The system of claim 1, wherein the print server being configured to

2   function as a proxy server to requests from the external device to provide

3   functionalities not supported by the print server.

1   15. The system of claim 14, wherein the print server being configured to

2   automatically forward requests, received from the external device, that are not

3   understood by the print server to an external service for further processing.

1   16. The system of claim 1, wherein the hard imaging devices comprise a

2   printer.

1   17. The system of claim 1, wherein individual ones of the plurality of

2   hard imaging devices being configured to implement a common printing protocol,

3   and the print server being configured to convert print requests from the external

4   device to the common printing protocol.

1   18. A print server system, comprising:

2   first and second communication networks configured to operate in

3   distinct communication link formats;

4   a plurality of printers individually configured to process print requests;

5   an external device communicatively coupled to the second

6   communications network, the external device configured to generate a print

7   request for processing by at least one of the plurality of printers;

8   a print server communicatively coupled to the first and second

9   communication networks, the print server being communicatively coupled to the

10   plurality of printers via the first communications network and to the external

11   device via the second communications network, the print server being

12   configured to receive a print request from the external device in a second

13   communication link format and generate a translated print request in a first

14   communication link format that is different from the second communication link

15 format, the translated print request being forwarded to at least one of the
16 plurality of printers for processing, the print server being further configured to
17 communicate with the external device with information regarding individual
18 printers supported by the print server even if the individual printers are
19 incompatible to directly process a print request from the external device, and the
20 print server being configured to function as a proxy server for requests, from the
21 external device, to enable functions not supported by the print server.

1   19. The system of claim 18, the print server comprising:
2   a communications interface being configured to communicate with the
3   first and second communications networks;
4   a storage device being configured to store information related to the
5   plurality of printers and instructions to process print requests received from the
6   external device; and
7   processing circuitry being configured to communicate with the external
8   device and individual ones of the plurality of printers, wherein communication
9   with the external device is performed using a second communication link format
10 and communication with the individual ones of the plurality of printers is
11 performed using a first communication link format that is different from the
12 second communication link format.

1   20. The system of claim 19, wherein the processing circuitry of the print
2   server comprises:
3   a volatile memory configured to store data for operation of the print
4   server;
5   a non-volatile memory configured to store firmware data; and
6   a plurality of physical layer components configured to convert print
7   requests from a communication link format to another distinct communication
8   link format.

1   21. The system of claim 20, wherein print requests from the external
2   device are received via the second communication network by one of the
3   physical layer components, processed by the processing circuitry, and

4   transmitted to the first communication network via another of the physical layer

5   components.

1   22.   The system of claim 20, wherein the processing circuitry further

2   comprises:

3   a plurality of media access controllers (MAC), individual MACs being

4   configured to provide link access to a specific communication protocol;

5   a first memory controller configured to control the volatile memory;

6   a second memory controller configured to control the non-volatile

7   memory;

8   information related to higher layer network protocols; and

9   bridge logic to enable flow of information between the first and second

10   communication networks.

1   23.   The system of claim 18, wherein the print server is configured to

2   forward requests, from the external device, that are not understood by the print

3   server to an external service.

1   24. A printer server system comprising:

2   a printer server means for communicatively coupling distinct

3   communication networks to enable communication therebetween;

4   a first communication means for communicatively linking the print server

5   means to a plurality of printers;

6   a second communication means for communicatively linking the print

7   server to an external device; and

8   the print server means configured for receiving a print request from the

9   external device in a second communication link format and automatically

10   generating a translated print request, in a first communication link format that is

11   different from the second communication link format, the translated print

12   request being forwarded by the printer server means for processing by at least

13   one of the plurality of printers, the print server means being configured for

14   automatically generating and communicating a signal to the external device, the

15   signal being indicative of individual printers among the plurality of printers that

16 are supported by the print server means even if the plurality of printers are not

17 configured to support the second communication link format.

1   25. The print server system of claim 24, wherein the print server means

2 being configured to support multiple discovery techniques including Bluetooth

3 service discovery protocol and Universal Plug and Play Service Discovery

4 protocol.

1   26. A print server system comprising:

2   a print server communicatively coupled to a plurality of printers via a first

3 communications network and to an external device via a second

4 communications network, the first and second communications networks being

5 configured to operate using distinct communication link formats;

6   a communications interface being configured to communicate with the

7 first and second communications networks;

8   a storage device being configured to store information related to the

9 plurality of printers and instructions to process print requests received from the

10 external device; and

11   processing circuitry configured to communicate with the external device

12 and individual ones of the plurality of printers, wherein communication with the

13 external device being performed using a second communication link format and

14 communication with the individual ones of the plurality of printers being

15 performed using a first communication link format that is different from the

16 second communication link format, the processing circuitry including:

17   a volatile memory configured to store data for operation of the

18 print server;

19   a non-volatile memory configured to store firmware data;

20   a plurality of physical layer components configured to convert print

21 requests from a communication link format to another distinct communication

22 link format; and

23   the print server being configured to receive a print request from the

24 external device in the second communication link format and generate a

25 translated print request in the first communication link format, the translated

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26   print request being forwarded to at least one of the plurality of printers for

27   processing.

1   27. The print server system of claim 26, wherein the print server being

2   further configured to communicate with the external device with information

3   regarding individual printers, supported by the print server even if the individual

4   printers are incompatible to directly process a print request from the external

5   device; and

6   further wherein the print server being configured to function as a proxy

7   server for requests, from the external device, to enable functions not supported

8   by the print server.

1   28. A method enabling communication between distinct communication

2   networks operating in distinct communication link formats, the method

3   comprising:

4   communicatively coupling the distinct communication networks to a print

5   server to enable communication therebetween via the print server;

6   communicatively linking the print server to a plurality of printers via a first

7   communication network among the distinct communication networks;

8   communicatively linking the print server to an external device via a

9   second communication network among the distinct communication networks;

10   configuring the print server to receive a print request from the external

11   device in a second communication link format and generate a translated print

12   request, in a first communication link format that is different from the second

13   communication link format, for processing by at least one of the plurality of

14   printers; and

15   configuring the print server to generate and communicate a signal to the

16   external device, the signal including information of individual printers, among the

17   plurality of printers, supported by the print server even if the plurality of hard

18   printers are not configured to support the second communication link format.

1   29. The method of claim 28, further comprising enabling a user of the

2   external device to identify the individual printers for servicing the print request

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3   generated in the second communication link format, wherein the print request is

4   sent via the print server.

1   30. The method of claim 29, further comprising:

2   configuring the first communications network as a local area network;

3   and

4   configuring the second communications network as a wireless network

5   configured to operate using a protocol selected from the group consisting of a

6   Bluetooth protocol, a 802.11 communication protocol, and a 802.11b

7   communication protocol.

1   31. The method of claim 28, further comprising:

2   configuring the print server to support multiple discovery techniques

3   including Bluetooth service discovery protocol, and universal plug and play

4   service discovery protocol; and

5   configuring the print server to advertise to the external device that the

6   print server supports a plurality of communication protocols and standards even

7   if the individual hard imaging devices of the plurality of hard imaging devices are

8   not configured to support the plurality of communication protocols and the

9   standards.

1   32. The method of claim 31, further comprising:

2   receiving print requests from the external device via the second

3   communication network by one of a plurality of physical layer components of

4   the print server;

5   processing the received print requests by a processing circuitry of the

6   print server;

7   transmitting the processed print requests to the second communication

8   network via another of the physical layer components; and

9   configuring the print server to function as a proxy server to requests from

10   the external device to provide functionalities not supported by the print server.

1   33. The method of claim 32, further comprising automatically forwarding

2   requests from the external device, that are not understood by the print server, to

3   an external service for further processing.

1   34. An article of manufacture, comprising:

2   processor-usable media comprising programming configured to cause a

3   print server apparatus of a print server system to:

4   receive a print request from an external device in a second

5   communication link format;

6   generate a translated print request in a first communication link

7   format that is different from the second communication link format for

8   processing by individual ones of a plurality of printers; and

9   generate and communicate a signal to the external device, the

10   signal being indicative of the individual printers supported by the print server

11   even if the plurality of hard imaging devices are not configured to support the

12   second communication link format.

1   35. The article of manufacture of claim 34, wherein the programming

2   comprises programming configured to enable the print server advertise to the

3   external device that the print server is configured to support a plurality of

4   communication protocols and standards even if the individual printers are not

5   configured to support the plurality of communication protocols and the

6   standards.